Grade 10 Science Andhra Pradesh 2022

Part-A

Time: 2 Hours 45 Mins.   **Maximum Marks: 50**

Instructions:

1. There are four sections and 33 questions in this paper.

2. Answer should be written in a given answer booklet.

3. There is internal choice in Section - IV.

4. Write all the Questions visible and legibly.

5. 15 minutes are given for reading the question paper and 2 hours 30 mins. for answering questions.

Section – 1

Note: Answer all the questions. $12 \times \frac{1}{2} = 6$

Q1. Three bodies A, B and C are in thermal equilibrium. The temperature of B is 50 °C. Then the temperature of C is

(A)   55 °C   (B)   50 °C   (C)   45 °C   (D)   40 °C

Correct answer: (B)

Solution:

As per the Zeroth Law of Thermodynamics, if A, B, and C are in thermal equilibrium, they must have the same temperature.

Q2. A solution turns red litmus into blue, its pH value is

(A)   1   (B)   4   (C)   5   (D) 10

Correct answer: (D)

Solution:

A solution that turns red litmus blue is basic in nature, and its pH value is greater than 7. Hence, the correct answer is 10.

Q3. Statement P: Optically denser medium may not possess greater mass density.

Statement Q: Kerosene with high refractive Index is optically denser than water.

(A) Both P and Q are correct.   (B)   P-correct, Q-wrong.

(C) P-wrong, Q-correct.   (D)   Both P and Q are wrong.

Correct answer: (A)

Solution:

Both statements are correct. Optical density is not always related to mass density, and kerosene has a higher refractive index than water.

Q4. Which of the following material cannot be used to make a lens?

(A) Water   (B) Glass   (C) Plastic   (D) Clay

Correct answer: (D)

Solution:

Clay cannot be used to make a lens as it is opaque.

Q5. The value of least distance of distinct vision of the healthy human beings_____.

Solution:

The least distance of distinct vision for a normal human eye is 25 cm.

Q6. Which rule is violated in the electronic configuration $1s^0 2s^2 2p^4$?

Solution:

The Pauli Exclusion Principle is violated because $1s^0$ means no electron is present in the first shell, which is incorrect.

Q7. Noble gases belong to _____ group of modern periodic table.

Solution:

Group 18.

Q8. Match the following:

Molecule	Bond angle
(i) Ammonia	(p) 104°31'
(ii) Boron trifluoride	(q) 107°48'
(iii) Water	(r) 120°

(A) (i)-(p), (ii)-(r}, (iii)-(q)

(B) (i)-(q), (ii)-(p), (iii)-(r)

(C) (i)-(q), (ii)-(r), (ili)-(p)

(D) (i)-(p), (ii)-(q), (iii)-(r)

Solution:

(C) (i)-(q), (ii)-(r), (iii)-(p)

Molecule	Bond angle
(i) Ammonia	(q) 107°48'
(ii) Boron trifluoride	(r) 120°
(iii) Water	(p) 104°31'

Q9. Which element is not having 8 electrons in its valency shell among noble gases?

Solution:

Helium has only 2 electrons in its valence shell.

Answer 10 and 11 questions based on below table:

Material	Silver	Iron	Drinking Water	Air
Specific Resistance (Ω-m) at 20 °C	1.59×10^{-8}	1×10^{-7}	2×10^{-1}	1.3×10^{16}

Q10. In which material the electric current is more?

Solution:

Specific resistance is lowest for silver (1.59×10^{-8} $\Omega \cdot$m), so current flows more easily in silver.

Q11. What is the SI unit of Specific Resistance?

Solution:

The SI unit of specific resistance (resistivity) is $\Omega \cdot m$ (ohm-meter).

Q12. The impurity present in the ore is called as_____.

(A)Gangue   (B) Flux   (C) Slag   (D)Mineral

Correct answer: (A)

Solution:

The impurity present in the ore is called gangue.

Section II

Note: **8x1=8**

(l)   Answer all the questions.

(2)   Each question carries 1 mark.

Q13. Convert 27°C into Kelvin scale.

Solution:

To convert Celsius to Kelvin, add 273 to the Celsius temperature.

$T_K = 27 + 273 = 300$ K

27 °C = 300K

Q14. Refractive index of glass relative to water is 8. What is the refractive index of water relative to glass?

Solution:

The refractive index of water relative to glass is the reciprocal of the refractive index of glass relative to water.

$$n_{\text{water/glass}} = \frac{1}{n_{\text{glass/water}}} = \frac{1}{8} = 0.125$$

0.125 is the refractive index of water relative to glass.

Q15. Write any two material required in the activity.

"To find the refractive index of a glass slab."
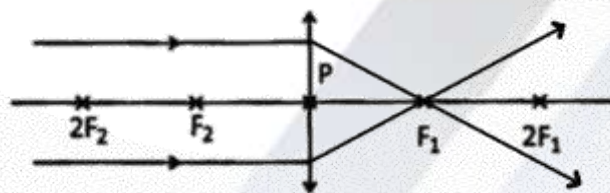
Solution:

'To find the refractive index of a glass slab, you'll need a rectangular glass block, a ray box or laser pointer, a protractor, and paper. First, direct the light source at an angle into the glass block.

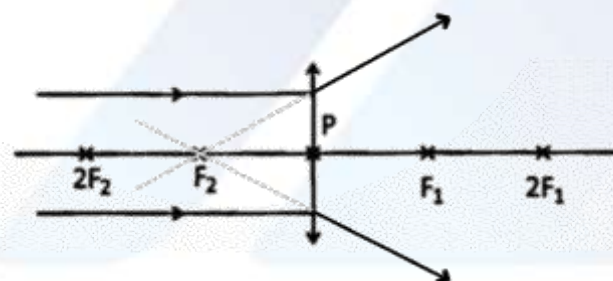**Q16.** Complete the ray diagram with appropriate refracted rays.
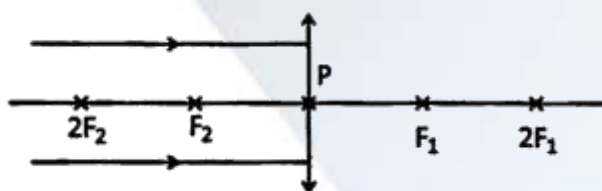
Solution:

For convex lens

For concave lens

Q17. An electron in an atom has the following set of four quantum numbers of $3s^1$?

n	l	m_l	m_s
3	0	0	+1/2

Then write four quantum numbers for $2s^1$ electron.

Solution:

For $2s^1$:

n=2 (principal quantum number)

l=0 (azimuthal quantum number for s-orbital)

m_l=0 (magnetic quantum number)

m_s=+1/2 (spin quantum number)

Q18. Write the Mendeleef's Periodic law.

Solution:

Mendeleev's Periodic Law states:

"The physical and chemical properties of elements are a periodic function of their atomic masses."

Q19. An element X belongs to 3rd period and group 2 of the modern periodic table. Predict the number of valence electrons and write.

Solution:

Group 2 elements are alkaline earth metals and have 2 valence electrons.

Q20. Mention the daily life application of thermite process.

Solution:

The thermite process is used for:

- Welding railway tracks or heavy iron objects.
- Repairing cracked machine parts.

Section III

Note: **8x2=16**

(1) Answer all the questions.

(2) Each question carries 2 marks.

Q21. Your friend is asked to differentiate between evaporation and boiling. What questions would you ask to make him to know the differences between evaporation and boiling?

Solution:

Questions asked to know the differences between evaporation and boiling are as follows:

- Does evaporation occur at all temperatures, or does it need a specific boiling point?
- Is boiling a surface phenomenon or a bulk phenomenon?
- What role does atmospheric pressure play in boiling compared to evaporation?

Q22. Write any two daily life uses of lenses.

Solution:

The two daily life uses of lenses.

- Lenses are used in spectacles to correct vision defects such as myopia and hypermetropia.
- Convex lenses are used in magnifying glasses to view small objects.

Q23. How do you appreciate the work of ciliary muscles in the eye?

Solution:

The ciliary muscles in the eye adjust the focal length of the eye lens, enabling us to see objects clearly at different distances. This process, called accommodation, helps us focus on both nearby and distant objects, ensuring clear vision.

Q24. Write the material required to prove Ohm's law activity.

Solution:

The material required to prove Ohm's law activity.

- A resistor (or resistance wire)

- A voltmeter
- An ammeter
- A battery or power source
- Connecting wires
- A switch

Q25. Fill the table given below :

Baking Soda	Washing Soda	
NaHCO₃		CaSO₄ . ½H₂O

Solution:

Baking Soda	Washing Soda	**Plaster of Paris**
NaHCO₃	**Na₂CO₃·10H₂O**	CaSO₄ . ½H₂O

Q26. Explain the terms in nl^x method.

Solution:

n: The principal quantum number denotes the energy level or shell in which the electron resides.

l: The azimuthal quantum number represents the subshell (shape of the orbital).

m_l: The magnetic quantum number specifies the orientation of the orbital in space.

m_s: The spin quantum number represents the spin of the electron (+1/2 or−1/2).

Q27. Predict the reasons for low melting point for covalent compounds when compared with Ionic compounds.

Solution:

- Covalent compounds consist of molecules held together by weak van der Waals or dipole-dipole forces, which require less energy to break.

- Ionic compounds have strong electrostatic forces between oppositely charged ions, requiring high energy to break.

Q28. Write the names of any two ores of Iron.

Solution:

Ores of Iron –

- Haematite- Fe_2O_3
- Magnetite- Fe_3O_4
- Siderite- $FeCO_3$

Section IV

Note: 5x4=20

(1) Answer all the questions.

(2) Each question carries 4 marks.

(3) Every Question hos Internal Choice.

Q29. What is Myopia? Explain the correction of the defect Myopia.

OR

Deduce the expression for the equivalent resistance of three resistors R_1, R_2, R_3 ohms connected in series.

Solution:

Myopia is an eye abnormality that causes the eye to view clearly only near objects. Objects at a distance will be blurry, and with this impairment, an eye will be unable to read characters that are somewhat further away.

Correction of Myopia:

A divergent lens is used to correct nearsightedness. Since the nature of nearsightedness is that light is focussed in front of the retina, a divergent lens will redirect light before it reaches the eye. This light is then focused by the cornea and lens to form a picture in the retina.
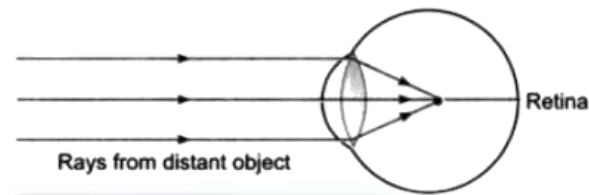
Myopic eye
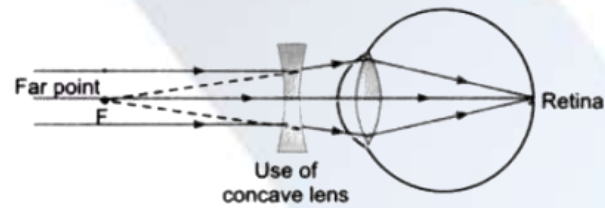
Correction for myopia

OR

Series combination of resistors:

When a number of resistors are linked end to end so that the same current runs through each of them sequentially, the resistors are said to be connected in series. Consider the three resistors (R).

R_1, R_2, and R_3 are connected in series. Assume a current (I) flows through the circuit when a V-volt cell is connected across the combination.

By Ohm's law, the potential differences across the three resistors will be,

$V_1=IR_1$, $V_2=IR_2$, $V_3=IR_3$

If R_s represents the comparable resistance of a series combination, applying a potential difference V across it results in the same current I flowing through it. Therefore,

V= IRS

But V= $V_1+V_2+V_3$

$\therefore IR_S= I(R_1+R_2+R_3)$

$R_s=R_1+R_2+R_3$

Laws of Resistance in Series

    (a) The current through each resistance is constant.

    (b) The total voltage across the combination is the sum of the voltage drops.

    (c) The voltage drop across any resistor is proportional to its resistance.

    (d) Equivalent resistance is the total of individual resistances and exceeds the biggest individual resistance.
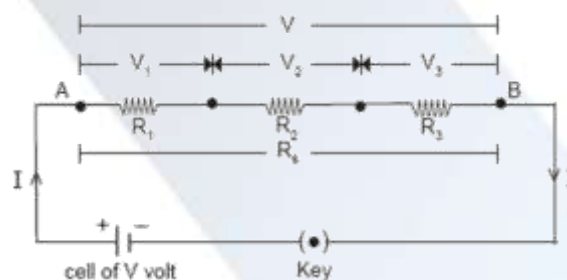
Q30. How do the following properties change in a group and period?

    (i)   Atomic radius

    (ii)   Ionization energy

    (iii)   Electron affinity

    (iv)   Electronegativity

<div align="center">**OR**</div>

Explain the formation of the O_2 molecule using valence bond theory.

Solution:

(i) Atomic Radius: The size of an atom is usually expressed in terms of its radius, called the atomic radius. It is the distance between the nucleus and the outermost shell of an atom. Atomic radii increase from top to bottom in a group because the number of shells increases. Atomic radii decrease across a period from left to right because electrons are added to the same shell, and the increasing nuclear charge pulls the electrons closer to the nucleus. Atomic radius is an important property as many physical and chemical properties depend on it.

(ii) Ionization Energy: Ionization energy is the amount of energy required to remove the most loosely bound electron from an isolated gaseous atom of an

element to form a gaseous ion in its ground state. Ionization energy decreases as we go down a group due to the increase in atomic size and shielding effect. It increases across a period from left to right due to the increasing nuclear charge.

(iii) Electron Affinity: Electron affinity is the energy released when an electron is added to a neutral gaseous atom to form a negative ion. Electron affinity generally decreases as we go down a group due to the increase in atomic size and decreases in effective nuclear attraction. It increases across a period from left to right as nuclear charge increases, making it easier to attract an additional electron.

(iv) Electronegativity: Electronegativity is the relative tendency of an atom to attract a shared pair of electrons towards itself when it is chemically bonded to an atom of another element. Electronegativity values of elements decrease as we go down a group due to the increase in atomic size and shielding effect. It increases across a period from left to right due to the increase in nuclear charge.
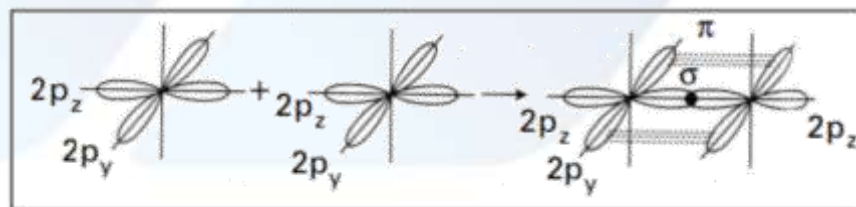
OR

(1) Electronic configuration of 'O' is $1s^2 2s^2 2p_x{}^2 sp_y{}^1 sp_z{}^1$.

(2) If the p_y orbital of one 'O' atom overlaps the py orbital of other 'O' atom along internuclear axis, a $\sigma p_y - p_y$ bond is formed.

(3) p_z orbital of oxygen atom overlap laterally, perpendicular to inter nuclear axis giving a $\pi p_z - p_z$ bond.

(4) So O_2 molecule has a double bond between the two oxygen atoms.

Q31. Suggest an experiment to find the specific heat of solid.

OR

How do you verify experimentally that $\dfrac{\sin i}{\sin r}$ is a constant?

Solution:

Aim: To find the specific heat of solid experimentally.

Material Required: Calorimeter, Thermometer, Stirrer, water, steam heater, wooden box and solid whose 'S' to be found

Procedure:

1. Measure the mass of calorimeter with stirrer
2. Now fill one third of volume of calorimeter with water. Measure its mass and its temperature
3. Take few lead shots quickly into the calorimeter (with minimum loss of heat). We will observe that the mixture settles to a certain temperature after some time. Measure this temperature and mass of calorimeter along with contents.
4. Since there is no loss of heat to surroundings, we can assume that the entire heat lost by the solid is transferred to the calorimeter and water to reach the final temperature.
5. Let the specific heats of the calorimeter, lead shots and water be S_c, S_l, S_w respectively, according to the method of mixtures we know that Heat lost by the body=Heat gain by the calorimeter + heat gain by the Water
6. Knowing the specific heats of calorimeter and water, we can calculate the specific heat of the solid (lead shots).

OR

Aim: Obtaining a relation between angle of incidence and angle of refraction

Materials required: A plank, white chart, protractor, scale, small black painted plank, a semicircular glass disc of thickness nearly 2 cm, pencil and laser light

Procedure: Take a wooden plank which is covered with white chart. Draw two perpendicular lines, passing through the middle of the paper. Let the point of intersection be O. Mark one line as NN which is normal to another line marked as MM.

Here MM represents the line drawn along the interface of two media and NN represents the normal drawn to this line at 'O'.

Take a protractor and place it along NN in such a way that its centers coincides with 'O' as shown in figure. Then mark the angles from 0° to 90° on both sides of the line NN as shown in the figure. Repeat the same on the other side of the line NN. The angles should be indicated on the curved line.

Now place a semi-circular glass disc so that its diameter coincides with the inter face line (MM) and its center coincides with the point 'O'.

Send laser light along a line which marks 15° with NN. Measure its corresponding angle of refraction. Repeat the experiment for 20°,30°, 40°, 50° and 60° and noted the corresponding angles of refraction.

If we calculate sin i, sin r ratio we will get the ratio as constant.
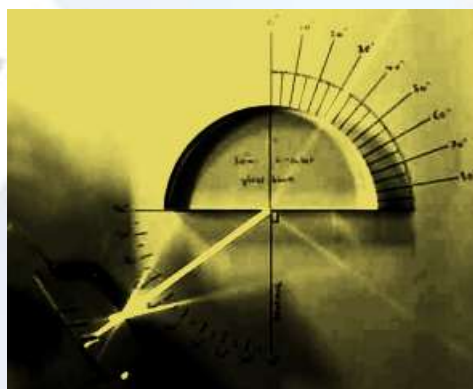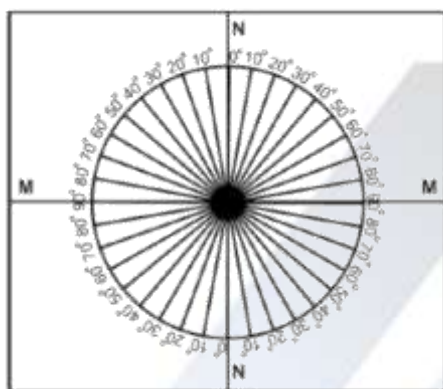
Q32. The Observe the table and answer the following questions :

Solution	A	B	C	D	E	F	G	H
pH Value	8	2	6	7	13	1	9	12

(i)   Which solution ls neutral?

(ii}   Which solutions are strong acids?

(iii) Which solutions are strong bases?

(Iv)   Which solutions are weak bases?

OR

Complete the following table:

Element	Atomic Number	Electronic Configuration
Carbon	6	$ls^2\ 2s^2\ 2p^2$
Oxygen	8	
Sodium	11	
Argon	18	
Calcium	20	

Solution:

(i) Solution D (pH = 7) is neutral because a pH of 7 indicates neutrality.

(ii) Solution B and F (pH = 2 and 1) are strong acids because they have pH values less than 3, indicating high acidity.

(iii) Solution E and H (pH = 13 and 12) are strong bases because they have pH values greater than 11, indicating high alkalinity.

(iv) Solution A and G (pH = 8 and 9) are weak bases because they have pH values slightly above 7, indicating mild alkalinity.

OR

Element	Atomic Number	Electronic Configuration
Carbon	6	$ls^2\ 2s^2\ 2p^2$
Oxygen	8	$ls^2\ 2s^2\ 2p^4$
Sodium	11	$1s^2\ 2s^2\ 2p^6\ 3s^1$
Argon	18	$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6$
Calcium	20	$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2$

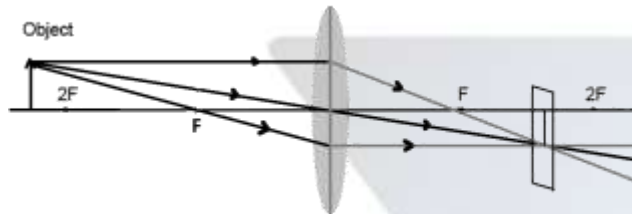Q33. Draw ray diagrams for the following positions with respect to convex lens :

(i) Object is placed beyond $2F_2$.
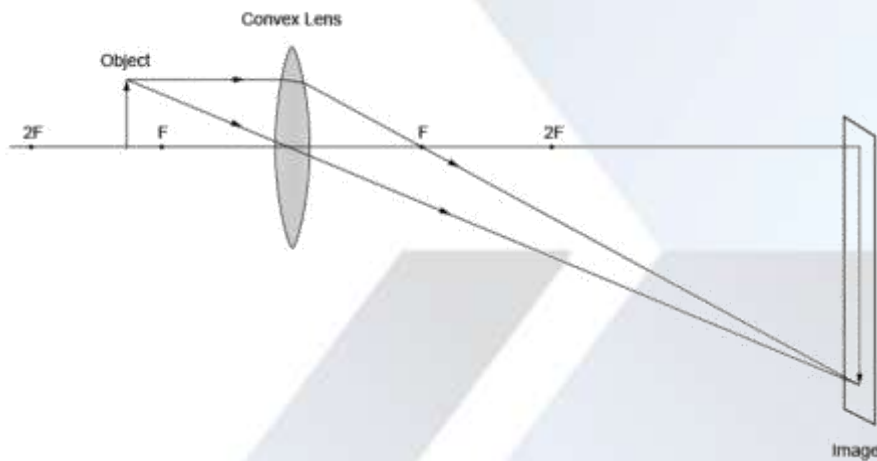
(ii) Object Is placed between $2F_2$ and F_2.

OR

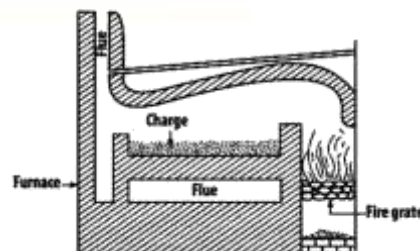Draw a neat diagram of Reverberatoey furnace.

Solution:

(i)

(ii)

OR

A reverberatory furnace is a metallurgical or process furnace that separates the material being treated from the fuel but not from the combustion gasses. The term reverberation is used in this context to refer to rebounding or reflecting, rather than echoing.

A Reverberatory Furnace

Part B

Time: 2 Hours 45 Mins.   **Maximum Marks: 50**

Instructions:

1. First 15 minutes are meant for reading the question paper and remaining 2 hours 30 minutes are for writing the exam.

2. Answer all questions in the given booklet.

3. The question paper contains four sections.

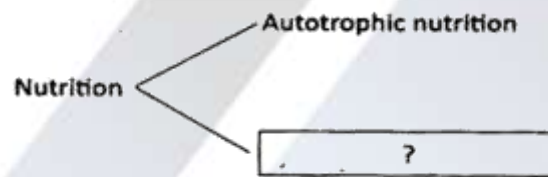4. Only section four has internal choice.

Section I

Note: $12 \times \frac{1}{2} = 6$

(1) Answer all the questions.

(2) Each question cafes 1/2 mark.

Q1. Write the missing part from the flowchart.
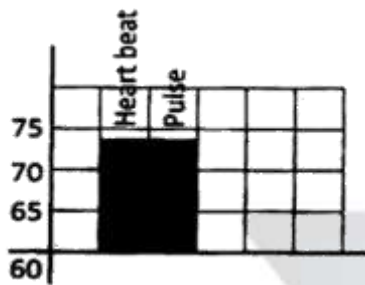

Solution:

Heterotrophic Nutrition

Q2. Pulmonary : Lungs : : Cardiac :_____.

Solution:

Pulmonary is related to the lungs; Cardiac refers to the **heart**.

Q3. Observe the sample graph.

What is the relationship between heart beat and the pulse?

Solution:

Heart beat is equal to the pulse rate.

Q4. Which is the largest part of the brain?

Solution:

The cerebrum is responsible for higher brain functions, including thought and action.

Q5. Who is called as the Father of genetics?

Solution:

Gregor Mendel is known as the Father of Genetics due to his experiments with pea plants.

Q6. John prepared an apparatus used to observe heart beat by using papercup and plastic tube. To which device does this model belong?

Solution:

Stethoscope

A stethoscope is used to listen to internal body sounds, including the heartbeat.

Q7. Complete the given food chain.

Solution:

Primary Consumers

Q8. Identify the logo.

Solution:

Sustainable development.

Q9. I am a Vitamin responsible for blood coagulation. Guess who am I?

Solution:

Vitamin K, plays an essential role in blood clotting.

Q10. Expand HIV.

Solution:

Human Immunodeficiency Virus

Q11. Name the Phytohormone responsible for cell elongation and differentiation of shoots and roots.

(A) Auxin   (B) Gibberellin   (C) Cytokinin   (D) Ethylene

Solution:

(A) Auxin - promotes elongation and differentiation in plants.

Q12. Identify the mismatched pair—

(i)   Producers —Frog, Cat

(ii)   Herbivores — Cow, Rabbit

(iii) Predators — Lion, Tiger

Solution:

(i) Producers — Frog, Cat (Incorrect)

Producers are plants and algae, not animals like frogs and cats.

Section - II

Q13. Label the parts given in the diagram.

Solution:

A Granum / grana

B Stroma Thylakoid

The labeled parts of the chloroplast diagram are:

A: Granum/Grana (stack of thylakoids)

B: Stroma Thylakoid

Chloroplasts are organelles found in plant cells and algae that conduct photosynthesis. They absorb sunlight and use it in conjunction with water and carbon dioxide to produce energy (food) for the plant and oxygen. Chloroplasts have a double membrane and contain thylakoids, which are membrane-bound compartments inside the chloroplast. Stacks of thylakoids are called grana.

Q14. Prepare a questionnaire to ask an Environmentalist about the consumption of fossil fuels.

Solution:

Questionnaire to ask an Environmentalist about the consumption of fossil fuels could be:

(i)   What are the harmful effects of burning fossil fuels?

(ii)   How can we reduce our dependency on fossil fuels?

(iii)   What are the best alternatives to fossil fuels?

(iv)   How do fossil fuels contribute to global warming?

Q15. What does this chart denote? In which phase the size of the cell increases?
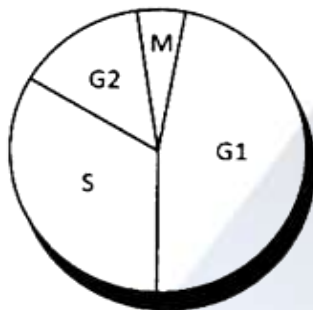
Solution:

The cell cycle chart showing G1, S, G2, and M phases represents the process of cell growth and division in eukaryotic cells. Here's what each phase denotes:

- G1 phase (Gap 1): The cell grows, synthesizes proteins, and prepares for DNA replication. This is the period in which the cell actively grows in size and performs typical metabolic processes.
- S phase (synthesis): The cell replicates its DNA in preparation for division. The chromosomes are duplicated, yielding two sister chromatids per chromosome.

- G2 phase (Gap 2): The cell continues to develop while preparing for mitosis. Additional organelles and proteins necessary for cell division are created.
- M phase (Mitosis): The cell divides its nucleus (mitosis) and cytoplasm (cytokinesis), resulting in two identical daughter cells.
  Phase in which cell size grows:
  The cell's size grows predominantly during the G1 phase when it synthesizes new proteins and organelles. The size increases slightly during the G2 phase, although the most substantial expansion happens in G1.

Q16. Which materials are required to study the Kidney of Goat/Sheep in the Laboratory?

Solution:

Materials required to study the Kidney of Goat/Sheep in the Laboratory are:

- Kidney of a goat/sheep.

- Dissection tray and tools.

- Scalpel and scissors.

- Water and disinfectants.

Q17. Write examples for renewable and non-renewable resources.

Solution:

Renewable resources include solar, wind, water, biomass, and non-renewable resources like coal, petroleum, natural gas, and minerals. Solar energy is inexhaustible, wind energy is generated by turbines, water is hydroponic, and biomass is organic matter. Non-renewable resources include coal, oil, natural gas, and minerals, which are limited in quantity.

Q18. Write slogans to stop child marriages.

Solution:

Slogans to stop child marriages are:

    a) Let children dream, not marry!

    b) Say no to child marriage, say yes to education!

    c) Their childhood, not your tradition!

    d) Small girls, big dreams—don't cut them short!

    e) Marry later, study greater!

    f) Stop child marriage, build a stronger future!

    g) Too young to wed, let them grow instead!

    h) Childhood is for learning, not for marrying!

    i) Don't lock their potential in a marriage!

    j) End child marriage—empower, educate, elevate!

Q19. Why Gliricidia plantation is done on the field bunds?

Solution:

Gliricidia is planted on field bunds to reduce soil erosion, increase soil fertility through nitrogen fixation, give green manure, and serve as a windbreak. Additionally, it provides firewood and fodder while requiring little upkeep.

Q20. Observe the following table and fill the table:

Sr. No.	None of the Gland	Hormone	Effect of the hormone
1	Ovary	(?)	Growth of uterus, menstrual cycle in females
2	?	Testosterone	Secondary sexual characters in males

Solution:

Sr. No.	None of the Gland	Hormone	Effect of the hormone
1	Ovary	**Estrogen**	Growth of uterus, menstrual cycle in females
2	**Testis**	Testosterone	Secondary sexual characters in males

Section III

Note: **8x2=16**

(1) Answer all the questions.

(2) Each question carries 2 marks.

Q21. Why did Mendel choose Garden-pea for his experiments?

Solution:

Mendel picked the garden pea for the following reasons:

- Easily observable traits: The plant possessed distinct, easily recognized characteristics such as blossom colour, seed form, and pod colour.
- Short life cycle: Garden pea plants grow and reproduce quickly, allowing Mendel to examine several generations in a short amount of time.
- Self-pollination and cross-pollination: The plant normally self-pollinates, but Mendel could simply manipulate cross-pollination to investigate inheritance.
- Large number of offspring: It produces a lot of seeds, which provides enough information for statistical analysis.
- Garden-peas are easy to cultivate and care in the garden.

Q22. What food habits you are going to follow after reading the chapter NUTRITION?

Solution:

After understanding the concept of nutrition, I will follow these food habits:

- Balanced diet: Include proper amounts of carbohydrates, proteins, fats, vitamins, and minerals.
- Hydration: Drink adequate water daily to maintain body functions.
- Fresh and natural foods: Prefer fresh fruits, vegetables, and home-cooked meals over processed food.

- Adequate protein: Add protein-rich foods like lentils, eggs, or dairy for growth and repair.
- Avoid junk food: Minimize sugary and fatty foods to maintain good health.
- Portion control: Eat in moderation to avoid overeating.
- Regular meals: Follow a consistent meal schedule and avoid skipping meals.

Q23. Observe the following table :

♀ \ ♂	Y	y
Y	YY	Yy
y	yY	yy

'YY' Pure breed of Yellow
'yy' Pure breed of Green

(i) What is the Phenotypic ratio of F_2 generation in monohybrid cross?

(ii) What is the dominant character in the given monohybrid cross?

Solution:

(i) The phenotypic ratio of the F_2 generation in a monohybrid cross is 3:1.

This means:

3 offspring show the dominant trait.

1 offspring shows the recessive trait.

For example, in Mendel's experiments with pea plants for height:

Tall (dominant) plants: 3

Dwarf (recessive) plants: 1

(ii) Yellow is the dominant character as per given table.

In a monohybrid cross, the dominant character is the trait that appears in the F_1 generation and is expressed in 3 out of 4 individuals in the F_2 generation.

Q24. If you have a chance to meet a Cardiologist, What questions do you ask to know about the heart diseases?

Solution:

If I had a chance to meet a cardiologist, I would ask the following questions to learn about heart diseases:

- What are the most common heart diseases and their causes?
- What lifestyle changes can help prevent heart diseases?
- How do symptoms of heart diseases differ in men and women?
- What are the warning signs of a heart attack?
- How does stress affect heart health, and how can it be managed?
- What is the role of diet in maintaining a healthy heart?
- How often should one go for heart check-ups?
- What are the risks of high cholesterol and how can it be controlled?
- How does physical activity impact heart health?
- What advancements have been made in treating heart diseases recently?

Q25. Observe the following and answer the given questions.

(i) Who discovered the first plant hormone 'auxin' by this experiment?

(ii) What are your observations in this experiment?

Solution:

(i) The first plant hormone, auxin, was discovered by F.W. Went through this experiment.

(ii) The observations are as follows:

- The tip of the plant contains a substance (auxin) that influences growth.
- When the tip is removed, the plant does not bend.
- If the tip is placed back in its original position, normal bending occurs.

- If the tip is placed off-center, the plant bends away from the side with more auxin, demonstrating phototropism.
- This experiment showed that auxin is responsible for the bending movement in plants toward light.

Q26. What precautions do you suggest to your elders during long Journey; regarding edema?

Solution:

- **Move and Stretch** – Walk or stretch your legs every 1-2 hours to improve blood circulation.
- **Stay Hydrated** – Drink enough water to prevent fluid retention and swelling.
- **Wear Comfortable Clothing** – Avoid tight clothes that may restrict blood flow.
- **Use Compression Socks** – These help reduce swelling in the legs and feet.
- **Limit Salt Intake** – Eating too much salt can cause fluid buildup, worsening edema.

Q27. Natural resources have been decreasing more rapidly. Guess what will be the consequences?

Solution:

The consequences of our rapidly decreasing natural resources will be:

(1) Scarcity of basic necessities: Critical resources like as water, food, and electricity will become scarce, resulting in shortages and increased expenses.

(2) Environmental degradation: Overexploitation can lead to deforestation, loss of biodiversity, soil erosion, and climate change.

(3) Economic instability: Industries that rely on natural resources, such as agriculture and energy, will experience difficulty, resulting in unemployment and economic downturns.

(4) Conflict over resources: Competition for limited resources can lead to disagreements between groups or countries.

(5) Biodiversity loss: As resources such as forests and ecosystems dwindle, plant and animal species will face extinction.

(6) Health issues: Pollution caused by over use of resources such as fossil fuels can contaminate the air and water, posing major health risks.

Q28. Write any two differences between sexual and asexual reproduction.

Solution:

The two differences between sexual and asexual reproduction:

(1) Number of Parents:

Sexual reproduction: Involves two parents (male and female).

Asexual reproduction: Involves only one parent.

(2) Variation:

Sexual reproduction: Offspring show genetic variation due to the combination of genes from both parents.

Asexual reproduction: Offspring are genetically identical to the parent (clones).